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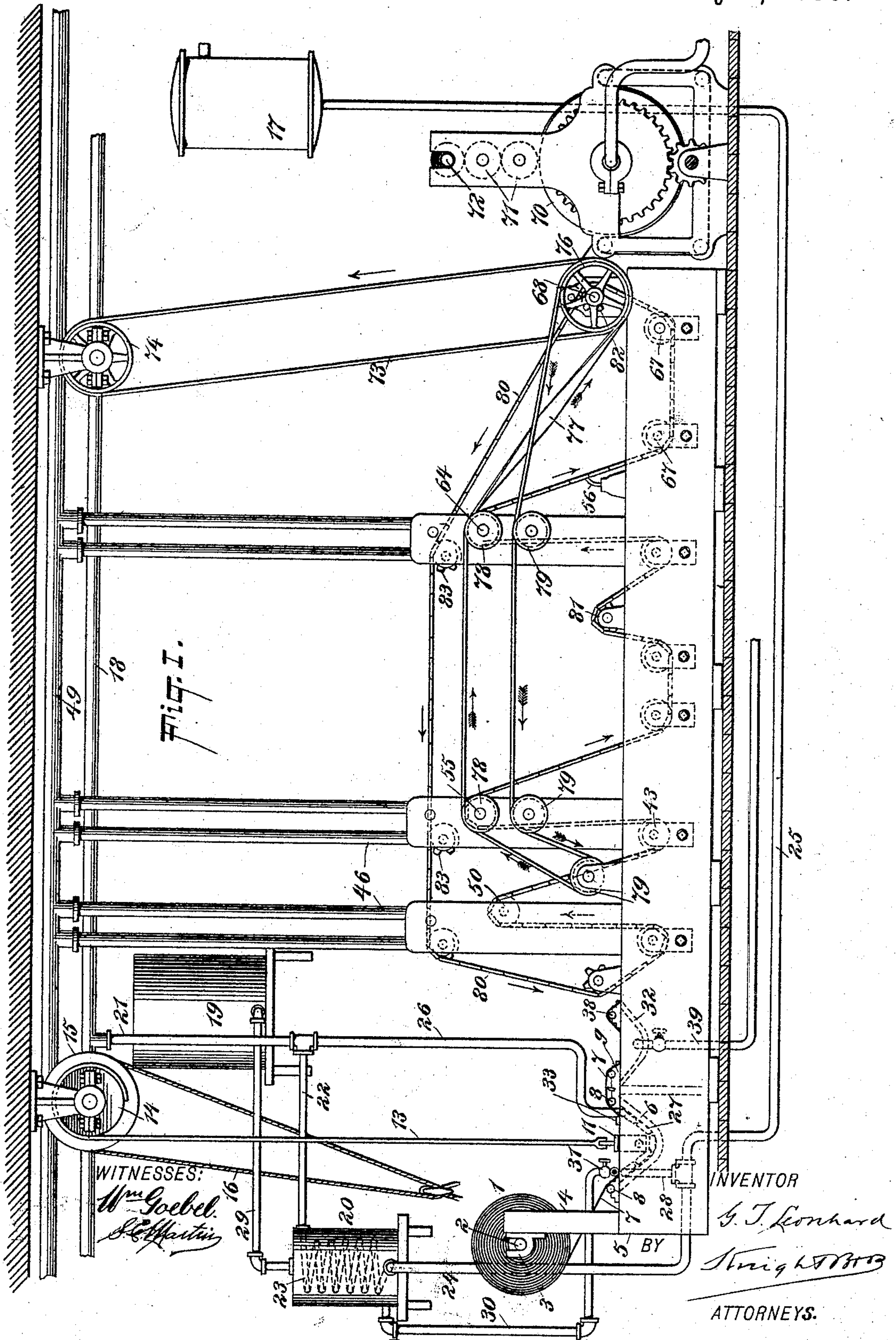
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G. T. LEONHARD.

MACHINE FOR MAKING VEGETABLE PARCHMENT PAPER.

No. 500,915.

Patented July 4, 1893.





(No Model.)

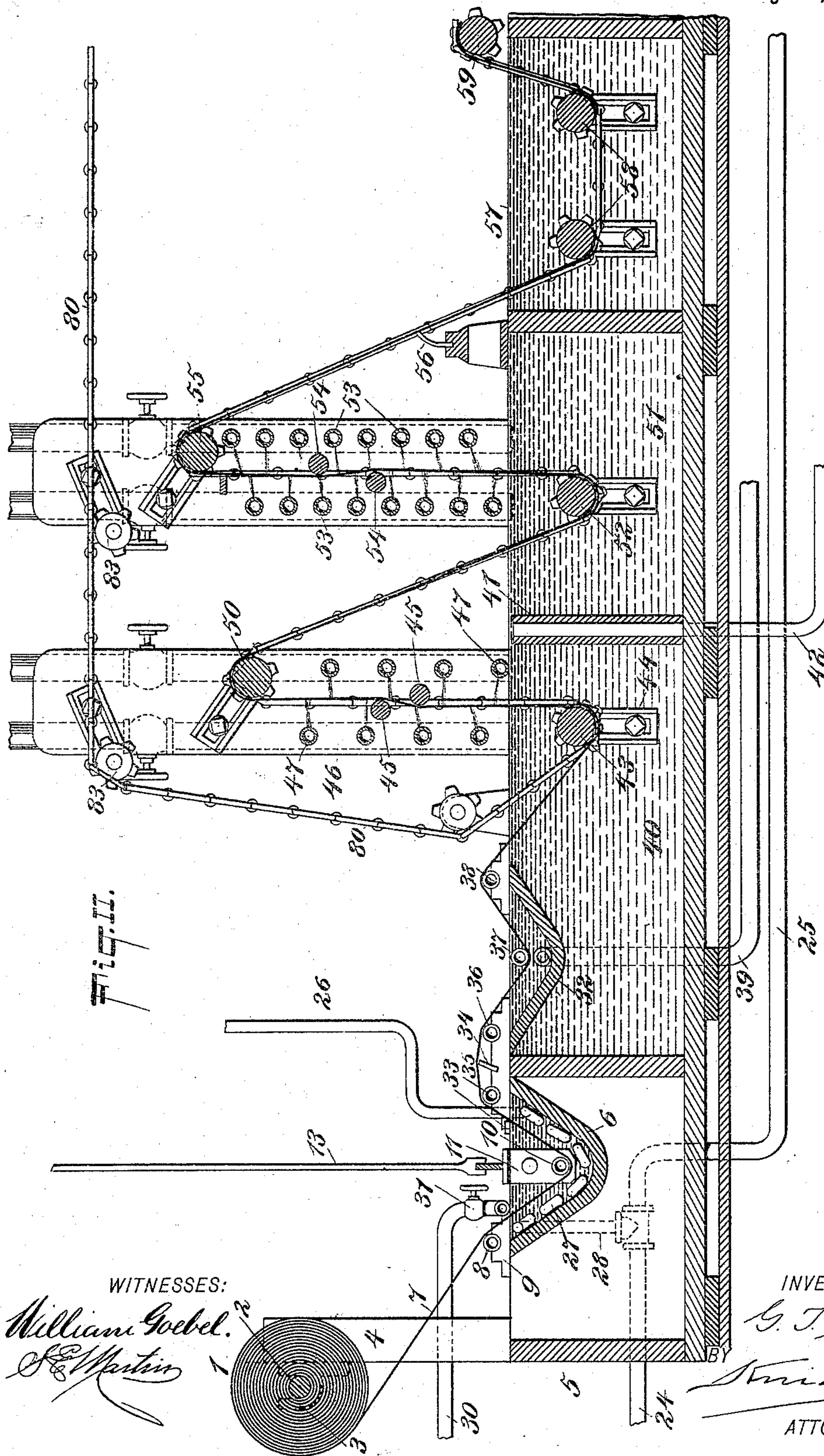
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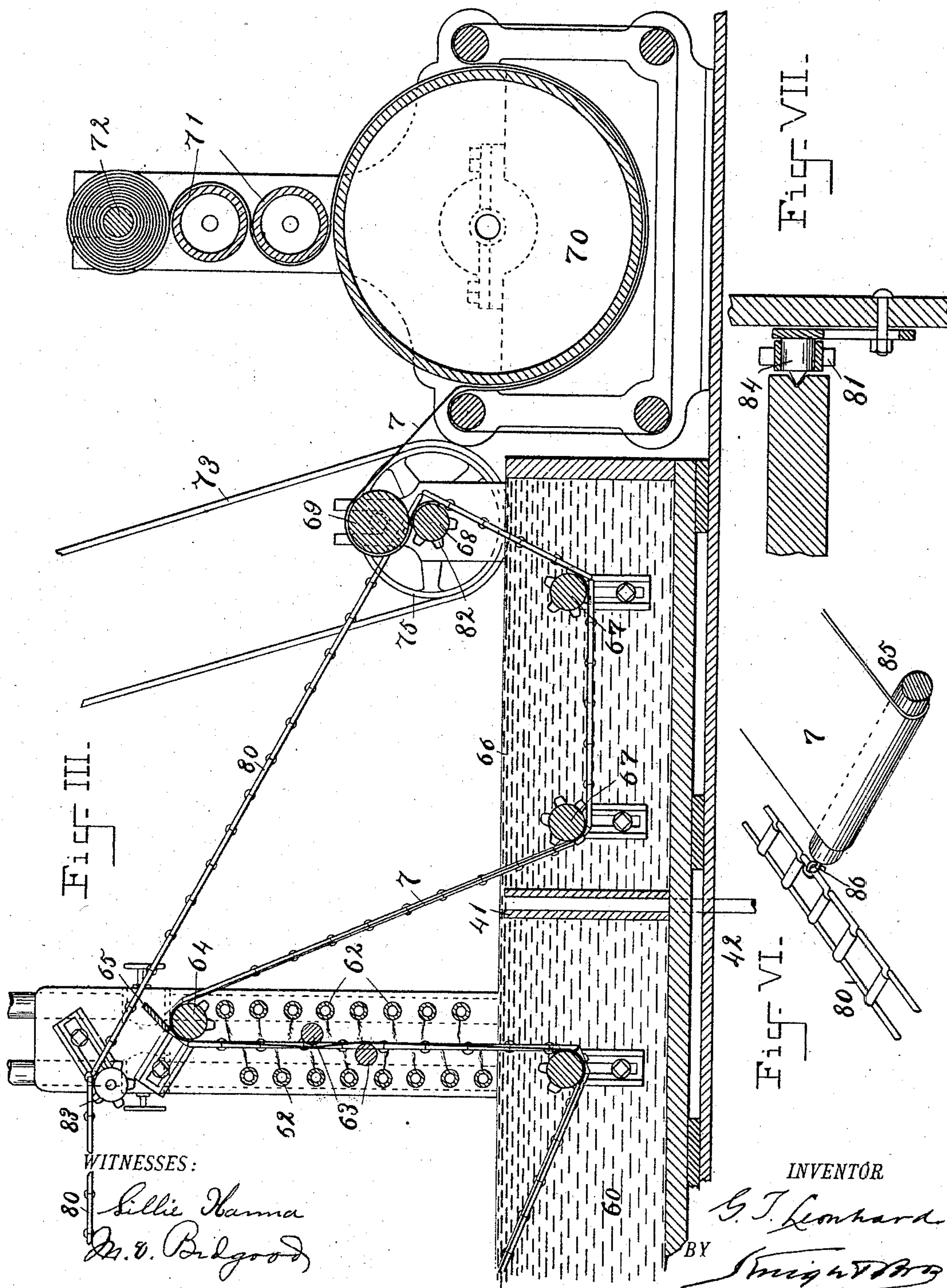
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*INVENTOR*

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(No Model.)

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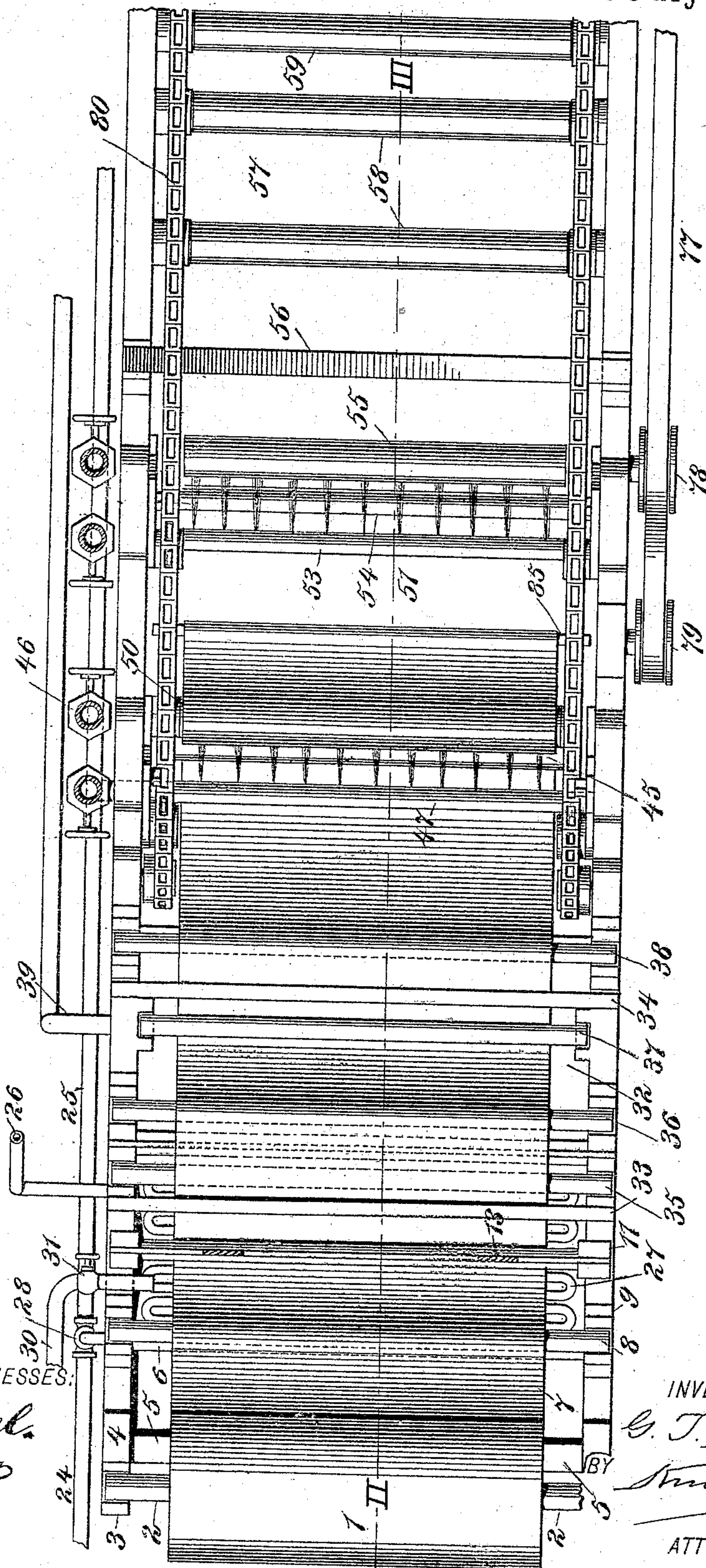
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Fig. IV.



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(No Model.)

5 Sheets—Sheet 5.

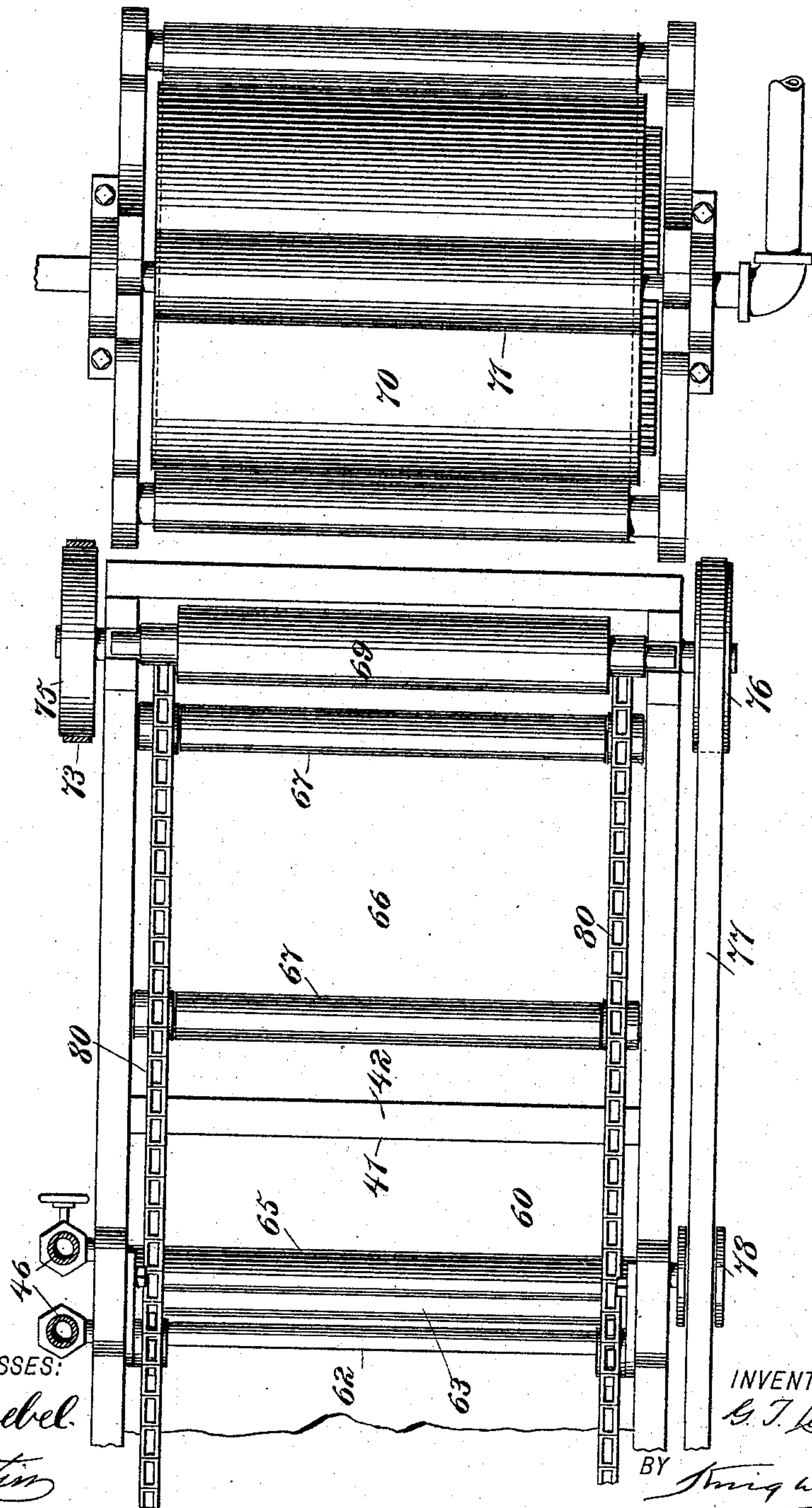
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Fig. V.



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# UNITED STATES PATENT OFFICE.

GOTTLÖB THEO. LEONHARD, OF PATERSON, NEW JERSEY.

## MACHINE FOR MAKING VEGETABLE PARCHMENT-PAPER.

SPECIFICATION forming part of Letters Patent No. 500,915, dated July 4, 1893.

Application filed October 5, 1892. Serial No. 447,898. (No model.)

*To all whom it may concern:*

Be it known that I, GOTTLÖB THEODORE LEONHARD, a citizen of the United States, residing at Paterson, county of Passaic, State of New Jersey, have invented certain new and useful Improvements in Machines for Making Vegetable Parchment-Paper, of which the following is a specification.

In some of the ways of making vegetable parchment paper, the roll of paper to be treated is subjected to a series of distinct operations and is rewound after each operation. To particularize: The paper from the fresh roll is led into the acid bath, is then washed and is rewound. The washing operation is performed by passing the sheet through water and over a series of horizontal rubbers it being subjected while passing over the rubbers to jets of water on its upper and lower surfaces. The washing is imperfectly performed, the weight of the water on the upper side of the paper pressing the latter down and impeding the action of the underneath flushing jets. The roll is removed from this first machine to a second machine where the washing is made more complete, the paper being again wound off the roll through water and over horizontal flushing devices and the arrangement is such that the upper and lower surfaces of the paper are reversed in this second washing. The paper is again rolled up in the second machine and may, if the paper be heavy, be removed to still another washing machine where the same operation is repeated. The paper roll is then transferred to a fourth machine and the paper is unwound through a neutralizer, such for instance, as dilute ammonia, is again washed and again wound up. The roll is then transferred to a fifth machine and more thoroughly washed and rewound. The roll is then transferred to a sixth machine where it is unwound, passed through a glycerine bath and rewound; thence it is transferred to the seventh and last machine where it is dried and wound. The result of all this handling is a great loss of paper in wastage. Each unwinding and rewinding involves the loss of some paper not only because some paper is destroyed in starting the roll each time but because each rewinding involves a slightly greater disloca-

tion of the sheet so that by the time the sheet has passed through the six preliminary machines and is ready for the drier the ends of the roll are extremely irregular and much paper is consequently wasted in trimming. The loss of time in transferring paper, in starting and re-starting so many machines and the necessary imperfection of the work where a number of different operations have to be relied on are also important items of loss.

The object of my present invention is to substitute for all of these machines, a single machine in which the paper is started from the fresh roll and passes, entirely without intelligent intervention except to guard against accidental mishaps, through one step after another until it is rewound after being dried.

My invention further involves certain details of construction in such a machine which I will first fully describe with reference to the accompanying drawings and then point out in the claims.

In said drawings, Figure I is a side elevation, partially diagrammatic, of a machine illustrating my invention. Figs. II and III are sectional views on the line indicated at II—III (Fig. IV) of the machine to a larger scale, the two figures together showing the whole machine. Figs. IV and V are plan views on the same scale with Figs. II and III and similarly illustrating in sections the entire machine. Fig. VI is a detail perspective view illustrating the method of attaching the paper web to the endless chains or belts when starting the paper through the machine. Fig. VII is a sectional detail view illustrating the support of a paper roller.

1 may represent a roll of paper mounted by the bar 2 in suitable hangers 3 carried by the standards 4 which are mounted at one end of the frame 5 of the machine.

6 is an acid bath tank usually of approximately V form as shown. The paper 7 from roll 1 passes over a glass rod or tube 8 which is mounted in seats 9 on the frame 5. The paper then enters the acid in tank 6 and passes down around a second glass rod or tube 10 which is supported by hangers 11 suspended by straps 13 the upper ends of which are wound on a drum 14. The drum 14 may be turned by the wheel 15 and ropes



16 when it is desired to raise the glass depressing rod 10 from the acid to enable the paper web to be started through the machine.

It is necessary to cool the acid artificially; to this end, I employ any usual form of refrigerating machine having means for forced circulation of the refrigerating material whether it be cold water, brine or ammonia. The construction of the refrigerating machine being immaterial, I have not thought it worth while to represent it and have merely indicated diagrammatically in Fig. I a cylinder 17 which may represent the brine tank of a system in which a refrigerating effect is obtained by a forced circulation of brine. From the refrigerating machine, a pipe 18 leads to a point adjacent to the paper treating machine or machines and it may be branched to any extent to supply any desired number of machines.

19 is the acid supply tank and 20 the acid cooling tank. The pipe 21 from the main brine supply pipe 18 has a branch 22 which connects with brine coil 23 placed inside of the cooler 20. The lower end of said coil discharges into the branch pipe 24 which is connected to the return pipe 25 of the brine tank 17. The pipe 21 is also connected by pipe 26 with a brine coil 27 preferably arranged within and close to the bottom of the acid bath 6 and from said coil a branch pipe 28 leads to the brine return pipe 25 and so back to the brine tank of the refrigerating machine. The acid from supply tank 19 flows by pipe 29 to the acid cooler 20 where its temperature is reduced by the brine coil 23 and it flows out through pipe 30 into the acid bath 6 with rapidity regulated by the cock 31. From the acid bath 6 the paper is led to the acid reclaiming tank 32 which is filled with fresh water whenever a new roll of paper is started. The paper issuing from the acid bath 6 however first passes between glass scrapers 33, 34 and over the glass rods or tubes 35, 36 so that a large part of the acid adhering to the paper is removed. The paper then passes down into the water of the acid reclaiming tank 32 and under the glass tube or rod 37 and passes from the tank 32 up over the glass rod or tube 38. The water in this tank 32 becomes strongly acidulated and is drawn off through the tube 39 for reclamation of the acid after each roll of paper has been treated, the tank being then re-filled as already stated. From the glass rod or tube 38 the paper passes down into the water of a tank 40 said tank being kept filled with water which flows from the flushing devices above and which is allowed to run off between the walls 41 and escape by pipe 42. The paper passes under the roller 43 which may be mounted adjustably by brackets 44 on the sides of the water tank 40. It then passes up on opposite sides of two scouring cylinders 45 which may have their surfaces covered by some coarse fabric and may be turned from time to time to present a fresh scouring surface.

On opposite sides of the web of paper on vertical standard pipes 46 are arranged two series of horizontal water pipes 47 which have a series of holes on their inner sides and which are connected by the vertical pipes 46 to a common water supply pipe 49. From the water pipes 47 jets of water are thrown constantly against the opposite faces of the paper web as it travels vertically from the roller 43 to the roller 50 and co-act with the scouring cylinders 45 in removing the acid from the paper. The paper web at this part of the operation is vertical or substantially so and the flushing operation acts with equal effectiveness on both sides of the paper. From the upper roller 50 the paper is led down into a second washing tank 51 passing around the roller 52 up between the flushing pipes 53 and scouring cylinders 54 until when the paper reaches the upper roller 55 of this second flushing and washing device, the acid is removed as much as it can effectively be by means of water. Scrapers 56, rubber covered squeeze rolls or other devices next remove the excess of water from the paper and the paper then passes into the neutralizing liquid contained in the tank 57. The rollers 58 guide the paper through the neutralizing bath and it then passes around the roller 59 and into the washing tank 60, around a roller 61, up between flushing pipes 62 and scouring cylinders 63 and over the roller 64. Here a scraper 65 may remove the excess of water and the paper web may pass directly to the drier or into the tank 66 for liquid (usually glycerine) for softening and adding weight to the paper. The rollers 67 keep the paper down in the glycerine as it passes through the tank 66 on its way to the roller 68. Passing around the roller 68 the paper may be wound on the roller 69, or the said roller 69 may be simply a squeeze roller over which the paper is led on the way to the drier or a series of driers. The drier may be of any desired construction. I have here illustrated the passing of the paper web around a large drying cylinder 70 between the pressing and calendering rollers 71 and on to the bar 72 where the roll is finally rewound.

The drier and the rest of the machine may have the same or separate driving mechanism. I have here supposed the drier to be operated separately and have shown a belt driven from the counter shaft 74 and operating the pulley 75 on the shaft and trunnion of roller 68 so that the roller 68 is utilized to draw the paper web through the machine.

I find in practice that it is desirable to ease somewhat the strain upon the paper not relying upon the paper web entirely for the drawing of the paper through the machine. To this end I mount on the shaft or trunnion of the roller 68 on the opposite side of the machine from the pulley 75 a second pulley 76 which drives an endless belt 77. This belt runs over pulleys 78 carried by the shafts or trunnions of the rollers 55 and 64 and bears



on them with sufficient pressure to slightly ease the movement of the paper or rather preferably with just sufficient pressure to relieve the paper from the strain caused by the weight of the rollers. The belt 77 is then led around the idle pulleys 79.

For starting the paper web, I employ the following mechanism: 80, 80 are chains or belts arranged one at each side of the machine and traveling immediately within the vertical water standards 46. The chains are endless and are mounted on a series of idle sprockets 81 each mounted on the trunnion or shaft 84 (see Fig. VII) of a paper roll, but traveling entirely free. The driving sprocket wheel 82 is carried by the shaft of roller 68. The upper part of the chains is carried by the idle sprocket wheels 83. The end of a paper web 7 is wound or otherwise fixed on a bar or stick 85 when a roll is to be started and hooks 86 at both ends of the bar or stick 85 are caught into the chains or belts 80, 80 in the manner shown in Fig. VI. To do this the glass depressing rod 10 is first lifted from the acid bath, the paper pulled off of the roll and passed under said rod and over the path indicated in Fig. II through the acid reclaiming tank 32 (which at that time is filled with pure water) and into the water tank 40. Here the stick 85 is connected to the chains as described and the machinery being started, the chain driving sprocket wheel 82 draws the chains and the attached web of paper through the machine causing them to follow the path already described. When the stick 85 reaches the rollers 68, 69, it is removed and the paper is drawn through by its friction upon the said rollers assisted only by the belt 77 as already described.

It will be seen that in this machine the paper moves steadily at a uniform speed through the machine from beginning to end, is not rewound until it has passed entirely through the parchmmentizing process and is not subject to the waste which, as I have pointed out, is present in the old process.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The combination of the acid bath tank 6 having refrigerating coil 27, the pipes 18, 25 for conveying a refrigerating liquid, the acid cooling tank 20 having means of connection with an acid supply tank, the coil 23 in said acid cooling tank 20 and arranged in connection with the pipes 18 and 25 and means for supplying the cooled acid from the tank 20 to the tank 6, substantially as shown and described.

2. The combination in a single machine of devices for treating a roll of paper with acid and washing and neutralizing the acid, rollers for guiding the paper through the machine continuously, means for drawing the paper through the machine at one end and endless chains or belts and means for connecting the paper positively with said chains or belts, substantially as set forth.

3. The combination of chains or belts 80, with a bar 85, for attachment to a paper strip, and means for detachably connecting said bar with said chains or belts, substantially as described.

G. THEO. LEONHARD.

Witnesses:

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